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cated. This peculiar behavior with water explains the impossibility of preparing the fluoride in the wet way.

When the anhydrous fluoride is heated to bright redness in a platinum tube closed at one end, fluorine at once begins to be evolved as gas; and, if a crystal of silicon be held at the mouth of the tube, it takes fire, and burns brilliantly in the gas. The residual platinum is found, on examining the contents of the tube, to consist of distinct crystals of the metal. Hence by far the most convenient method of preparing fluorine for lecture purposes is to form a considerable quantity of the fluoride, first, by passing the product of the electrolysis over bundles of platinum wire heated to low redness, and afterwards to heat the fluoride thus obtained to full redness in a platinum tube closed at one end. It only remains now to discover another method of preparing fluoride of platinum in the dry way, to be able to dispense with the expensive electrolysis apparatus altogether. M. Moissan has also prepared a fluoride of gold in the same manner. It is likewise very hygroscopic, decomposable by water, and yields gaseous fluorine on heating to redness.

MENTAL SCIENCE.

Diseases of the Memory.

CASES of amnesia, or the loss of a small or large portion of the contents of the mental storehouse, have been observed from very ancient times, and have always attracted attention. The decline of mental powers brought on by old age is frequently introduced by a failure of memory. When, however, this sets in at an earlier period, and develops rapidly and to an extreme degree, we recognize an abnormal and striking phenomenon. The possibility of such loss, particularly when following a purely physical cause, such as a blow, a fall, or other accident, could not but suggest the physiological counterpart of the memory process as something very material. To-day we attempt to analyze such cases more minutely, recognizing in the diseases of memory a natural experiment that throws light upon the laws of mental growth and decay, the interrelation of the various avenues of knowledge, as well as the *nexus* of mental function with anatomical characteristics. In all these aspects a recent study of diseases of memory by Dr. Korsakoff of Moscow (*Revue Philosophique*, November, 1889) is interesting.

The first case described is that of a Russian writer afflicted with multiple neuritis,—a nervous disease affecting many groups of fibres, as a consequence of alcoholic excess. When the patient was first seen, the trouble was very marked. He had completely forgotten all recent events: he did not even remember whether he had dined or not. The conversation just held was at once forgotten; and, when outsiders insisted that such and such things happened that the patient had forgotten, he lightly remarked that he always had a poor memory. Very striking is the fact that every thing previous to the onset of the disease he remembers clearly. Of a novel that he was writing at the time, and had half finished, he remembers the first half, but does not remember how he intended to finish it. Though the domain of his thoughts is limited, his reasonings are logical, and his judgment sound. But a slight interruption in the conversation will make him forget what it was about; and he will say the same things over and over again, using the same stereotyped forms of expression, and forgetting that he has said it. Moreover, under the influence of certain external stimuli, certain positions and suggestions, he will always make the same remarks, in which he draws upon the old storehouse without adding to it. There are indications, too, that to a slight degree the unconscious registration of impressions is going on. Thus, though he forgets Dr. Korsakoff between each visit, he always makes the remark (regarding it as original each time) that the latter is a physician. Emotions and feelings make more of an impression than facts and associations. A *post-mortem* examination in this case showed degeneration of both fibres and cells, which had also been inferred from paralysis and other symptoms observed in the patient.

Impairment of memory is characteristic of this disease; the memory for recent events being lost, while that for events antedating the attack remains, and the patient retains judgment and reasoning power. The same patient who forgets that he has dined five

minutes after leaving the table can play cards or checkers with fair skill, anticipating the consequences of his or his adversary's plays, and following out a plan of attack or defence. If the game is slightly disturbed, he cannot go on. The moment he is through playing, he knows nothing of it, and will declare he has not played for a long time. The contrast between the past and the present is sharply brought out in one patient who tells of his travels at great length, but repeats the tale a dozen times an hour, and always with the same phrases. Sometimes the patient does not even recall that he is ill, explaining a paralysis as a momentary cramp in the legs, and expressing his intention of rising as soon as that has passed. The same patient will cry out under his pain, but a moment later will have forgotten the sound and the pain. To show how slight an interval is needed for the impression to disappear, it may be mentioned that this patient, in reading, will read the same line twice, having forgotten the one line before setting out upon the next. Those who are constantly with such patients soon get to know what they will say upon the usual occasions. Their life is monotonous,—a response to the suggestions from the outside, and not originating from internal impulses. They are frequently conscious of their infirmity, and anxious lest they commit some indiscretion.

Dr. Korsakoff thinks, that while the patient does not consciously remember what is going on, yet the surrounding events leave some trace by which future conduct is influenced. Thus a patient who was undergoing an electric treatment, and forgot all about it each time, not being able to tell what the doctor was about to do, if asked to look about him, recognized the apparatus and its purpose, which he did not know before his illness. Another patient, who said "Good-morning!" when the doctor made his first visit of the day, did not remember the visit three minutes later, but did not then say "Good-morning!" The most convincing proof of this, however, appears when recovery sets in, and the patient begins to tell some little of what happened during his illness. In one case a sphygmograph was described,—an instrument the patient had seen only during his amnesic period. Emotional states seem the ones most susceptible of this unconscious perception. While the patient forgets his visitors from one time to another, yet he meets them with sympathy or antipathy, according to previous experiences; or, again, a patient who was treated with electricity remembered nothing of it, but was always put into a bad humor when he saw the machine.

In the process of recovery, usually quite gradual, several interesting phenomena appear. Frequently the patient begins to remember events, but in isolation. He cannot tell what happened just before or just after. He cannot tell *when* things happened; as a rule, regarding all things as more recent than they really are. When he begins to remember new faces and places, he still continues to repeat the same sayings again and again. He will be able to say that he has read a certain thing, but does not remember what it contained. Though not able to recall the events of his illness at will, an incident or a suggestion may bring it up. Little by little his past is filled out, though in a somewhat chaotic manner; dreams and the products of his imagination intermingling with real events without definite relation in time. He frequently continues to believe what has no basis in fact. His recovery is often a matter of two or three years. In another case, after five years the memory of the patient continued weak. He was able to resume his occupation of correcting sheets for the press, but had to keep his finger on the lines so as not to go over the same line twice. He even began to practise law, though he was compelled to avail himself of all sorts of memoranda, and was frequently perplexed by forgetting what he had said; yet he was able to conduct himself consistently. The memory for places, streets, and houses, localities in general, is restored long before that for time.

Dr. Korsakoff next attempts to analyze just what factor in memory is affected, concluding that it is simply the power to recall impressions; the facts above cited showing that the impression is made, though very faintly. Moreover, as recollection is based upon association, those ideas being most at command that have the widest and deepest associative connections, the defect is referred to that portion of the nervous system instrumental in connecting nerve-centres with one another. Into a more detailed and neces-

sarily hypothetical explanation of the relation between memory and nerve-cell, we need not enter. The main result connects the easiness of forgetting recent impressions with instability of nerve-cell, and isolation from the cell groups; while the older, more deeply impressed and integrated experiences remain.

A corroboration of this result is found in the fact that in the recovery there is a stage in which the patient remembers that a thing happened, but not where or how; not even, perhaps, whether it was dreamed, or really experienced. The associations that localize the event are not made, although the impression made by the event is there. Only in the final stages of recovery are the associations and the facts remembered.

NOTES AND NEWS.

A STALACTITE cave has been discovered in Ascheloh, near Halle, in Westphalia. It is reported to be more than 100 metres long.

— A series of questions on the effect of London fogs on cultivated plants has been issued by the scientific committee of the Royal Horticultural Society. The experience of the current season only is to be utilized.

— A hippopotamus was born in the Central Park menagerie, this city, on the night of Dec. 1; and this is said to be the first instance of an event of this kind in this country. Unfortunately it died on the 6th of pneumonia, as we learn from the *Boston Medical and Surgical Journal*.

— The Gilbert Club, to which we referred last week, was formally founded on Thursday, Nov. 28. The following officers were appointed at the first general meeting: president, Sir William Thomson; vice-presidents: Lord Rayleigh, Professor D. E. Hughes, Professor Reinold, Mr. Jonathan Hutchinson (president of the Royal College of Surgeons), Dr. B. W. Richardson, and Mr. H. Laver of Colchester. Mr. Latimer Clark was elected treasurer; and Mr. Conrad Cooke, Professor R. Meldola, and Professor S. P. Thompson, honorary secretaries. The resolution finally adopted by the meeting was, according to *Nature*, "That the objects of the Gilbert Club be as follows: (1) to produce and issue an English translation of 'De Magnete' in the manner of the folio edition of 1600; (2) to arrange hereafter for the tercentenary celebration of the publication of 'De Magnete' in the year 1900; (3) to promote inquiries into the personal history, life, works, and writings of Dr. Gilbert; (4) to have power, after the completion of the English edition of 'De Magnete,' to undertake the reproduction of other early works on electricity and magnetism, provided at such date a majority of the members of the club so desire." At the time of the inaugural meeting eighty-seven members had joined the club.

— The chief signal officer has adopted a signal known as the "information signal," and forming one of the system of "storm, cautionary, and wind-direction signals." The "information signal" consists of a yellow pennant, of the same dimensions as the red and the white pennants (wind-direction signals), and, when displayed, indicates that the local observer has received information from the central office of a storm covering a limited area, dangerous only for vessels about to sail to certain ports. The signal will serve as a notification to ship-masters that the necessary information will be given them upon application to the local observer. The use of this signal began Dec. 1. It is believed that the display of the "information signal" will in many instances obviate the necessity for the display of the "cautionary signal" (yellow flag with white centre). The signal at night for indicating westerly winds is now a white light above a red light.

— Lieut.-Commander Charles H. Stockton, U.S.N., commanding the United States steamship "Thetis," reports to the United States Hydrographic Office that during the past summer, while on the north and north-west coasts of Alaska, the "Thetis" set adrift numerous drift floats. These floats are made of wood, about 2 feet long and 9½ inches thick, with the name of the ship, date, and the words "for drift," cut upon the face. In a cavity at one end of the float, plugged with soft wood, there is a copper cylinder containing a letter requesting the finder to inform the Hydrographic

Office, Washington, D.C., the nearest United States consul, or the commanding officer of the "Thetis," the time and place where the float was found. These floats are intended to show the direction and strength of the currents off the coast of Alaska, and any information obtained from them will be of value to navigation. Masters of vessels in Alaskan waters, or residents on the coast of Alaska, finding any of these floats, are especially requested to comply with the request contained in each copper cylinder.

— A course of public lectures was begun before the New York Academy of Sciences, Madison Avenue and 49th Street, on Monday evening, Dec. 2, at eight o'clock, to continue until May 19, 1890. The following is a list of the lecturers, together with the subjects and dates of the lectures: Dec. 2, "The Raiyan-Mæris: the Irrigation of Ancient and Modern Egypt" (illustrated by the lantern), by Mr. F. Cope Whitehouse of New York; Dec. 16, "Strategic Features of the Gulf of Mexico and the Caribbean Sea" (illustrated by maps), by Capt. A. T. Mahan, U.S.A.; Jan. 20, 1890, "The Ice Age in North America, and the Antiquity of Man" (illustrated by the lantern), by Professor G. Frederick Wright, Oberlin College, Ohio; Feb. 17, "Four Weeks in the Desert of Mount Sinai" (illustrated by the lantern), by Dr. H. Carrington Bolton of New York; March 17, "Nebulæ and the Nebular Hypothesis" (illustrated by the lantern), by Professor Charles A. Young, Princeton, N.J.; March 31, "Volts and Ampères, and What they mean" (to be held in the chemical lecture-room, School of Mines; illustrated by electrical apparatus and experiments), by Professor Charles F. Chandler, Columbia College; April 14, "Methods of Research in Bacteriology" (illustrated by photo-micrographs of bacteria), by Major George M. Sternberg, M.D.; April 28, "Glimpses of the Arctic Regions" (illustrated by the lantern), by Mr. William Bradford of New York; May 19, "Grand Cañon of the Colorado" (illustrated by the lantern), by Professor Rossiter W. Raymond of Brooklyn.

— The question of a system of improved public roads, to which we refer elsewhere, is one so closely related to every material interest of the State as to place it properly among the most important questions of public economy. The science of road making and maintaining, though neither difficult nor abstruse, is nevertheless based on principles so well established, and so unvarying in their operation, as to render their thorough comprehension an essential to success in securing and maintaining public roads at once efficient and economical, whatever the administrative system by which they are constructed and controlled. In other countries the superintendence of public highways is recognized as an important and responsible duty, and is usually assigned to specially trained, expert government engineers; while in the United States, where the greater mileage makes the economy, if not the efficiency, of roads even more important than abroad, the States depend for this responsible service on private citizens, locally and temporarily appointed to the duty, without providing for them the technical instruction and training so essential to success under any system. To offer such as desire it an opportunity to make good, in part, this defect, the Engineering Department of Vanderbilt University, Nashville, Tenn., continues its offer of former years to admit free of charge, to a class in road engineering, one principal or deputy highway official from each county in Tennessee. The appointment shall be made by the chairman of the county court, on or before Jan. 1, 1890, and must set forth that the candidate is in a position to be of benefit to the public road-system of the county wherein he resides. If in a county no applicant apply for appointment before Jan. 1, the chairman of the county court shall, until Feb. 1, 1890, have the privilege of appointing one similarly qualified applicant from any other county of any State. The course of instruction will extend from Feb. 1 till April 1, and will consist of lectures and work on the economical location of highways to conform to conditions of topography and traffic; principles of construction of new and reconstruction of old roads, and of maintenance *vs.* repairs; methods of drainage; simple highway structures, retaining walls, drains, culverts, simple bridges; practice in field-sketching, simple platting and draughting, instrumental location, and computing estimates of cost; and study of systems of highway administration.